

IN THE CLAIMS

Claims

1. (Currently amended) A catheter device [having] comprising:

a shaft that extends from a proximal end to a distal end to carry on its distal end a [self-expanding] a medical implant for intraluminal advance on a guidewire and delivery of the medical implant to a treatment [stenting] site [by proximal withdrawal of], the shaft defining a flushing lumen and a proximal guidewire exit port that is distal of the proximal end of the shaft for rapid exchange of the catheter with respect to the guidewire;

a sheath that lies radially outside the medical implant in the catheter that is proximally withdrawn from the medical implant[the catheter including];

a first shaft element including at least one of a pull wire and a rod to pull the sheath proximally; and

a second shaft element including a pusher tube to push the medical implant distally to prevent the medical implant from moving proximally with the sheath when the sheath is pulled proximally by the first shaft element[, wherein

- i) the shaft defines a flushing lumen
- ii) the shaft defines a proximal guidewire exit port that is distal of the proximal end of the shaft, for rapid exchange of the catheter with respect to the guidewire
- iii) the first shaft element is a pull wire
- iv) the second shaft element is a pusher tube].

2. (Currently amended) Catheter as claimed in claim 1, wherein the sheath comprises [has] a tapered distal tip.

3. (Currently amended) Catheter as claimed in claim 1 [or 2], wherein the pull wire is coupled to the sheath by an inner pull ring located radially inside the sheath, the pull wire and pull ring being both of metal and with a metal bond between the pull wire and

the pull ring.

4. (Currently amended) Catheter as claimed in claim 3, further including an outer pull ring radially outside the sheath and the inner pull ring, [with] the sheath being compressed between the inner and outer pull rings.
5. (Currently amended) Catheter as claimed in [any one of the preceding claims] claim 1, wherein the sheath is polymeric and carries within its wall thickness a braid of metallic filaments.
6. (Currently amended) Catheter as claimed [in any one of the preceding claims] claim 1, wherein the pusher tube [has] comprises a distal end to which is fixed side-by-side, the proximal end of a pusher-guider tube that defines a lumen for [said] the guidewire.
7. (Currently amended) Catheter as claimed in claim 6, wherein the pusher-guider tube [is formed from] comprises a spiral metal filament [and] that carries a stopper ring, wherein the second shaft element includes the pusher tube, the pusher-guider tube and the stopper ring [serving as said second shaft elements].
8. (Currently amended) Catheter as claimed in claim 7, wherein the pusher-guider tube extends distal of the stopper ring[,] to the distal tip of the catheter.
9. (Currently amended) Catheter as claimed in claim [6, 7 or] 8, further comprising[with] an adaptor block to connect the pusher tube and the pusher-guider tube, the block defining two lumens side-by-side, one for the pusher tube and the other for the pusher-guider tube.
10. (Currently amended) Catheter as claimed in [any one of the preceding claims] claim 1, further including a flushing sleeve that is contiguous with the sheath and defines a lumen that contains the pusher tube.
11. (Original) Catheter as claimed in claim 10, wherein the shaft includes a guider block that has a cylindrical outside surface to receive the flushing sleeve, a guidewire lumen, and a lumen side-by-side with the guidewire lumen to receive the pusher tube.

12. (Original) Catheter as claimed in claim 11, wherein the flushing sleeve distal of the guider-block includes a bellows tube.
13. (Currently amended) Catheter as claimed in claim [11 or] 12, wherein the flushing sleeve distal of the guider block includes a telescopic tube.
14. (Currently amended) Catheter as claimed in claim [11, 12 or] 13, wherein the guider block is fixed against axial movement with respect to the pusher tube and with respect to the flushing sleeve on its cylindrical surface.
15. (Original) Catheter as claimed in claim 14, wherein the proximal guidewire exit port is immediately proximal of the guider block.
16. (Currently amended) Catheter as claimed in [any one of claims 11 to] claim 15, wherein the guider block is located around 75 cm from the distal tip of the catheter.
17. (Currently amended) Catheter as claimed in claim 15 [or 16], [and] further including a steering tube that protrudes from [said] the exit port and can be pulled out of the catheter, and wherein the guidewire lumen continues proximally from the exit port to a second more proximal exit port, proximal of the proximal exit port, and wherein the steering tube can be pulled out of the catheter to permit a guidewire to advance proximally beyond the location of the steering tube, as far as the more proximal exit port.
18. (Original) Catheter as claimed in claim 17, wherein the more proximal exit port is defined in a hub that also defines a flushing port for introduction of flushing fluid to the flushing lumen.
19. (Currently amended) Method of manipulating a self-expanding stent comprising: [the step of]

loading the stent into a rapid exchange transluminal stent delivery catheter system[which releases the stent by] : and

pulling on a pull wire to pull proximally relative to the stent a sheath that lies radially outside the stent to release the stent.

20. (Currently amended) Catheter as claimed [in any one of claims 1 to 18] claim 1, wherein the medical implant devices comprises one of [including] a self-expanding stent, a stent, a stent graph, and a filter.
21. (Currently amended) Method of placing a self-expanding stent comprising: [the steps of]
- [i)] taking a catheter [as claimed in claim 20 and] having a shaft defining a flushing lumen and a proximal guidewire exit port, a sheath that lies radially outside the shaft, a pull wire to pull the sheath and a pusher tube partially disposed in the sheath; advancing it to a stenting site along a guidewire;
 - [ii)] pulling on the pull wire to release the stent; and
 - [iii)] withdrawing the catheter and guidewire after release of the stent from the catheter.